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### **Horseshoe-like Hoof Pad Lining**

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The invention concerns a horseshoe-like hoof pad lining forming an essentially flat plate comprised of flexible plastic material in order to avoid the adhesion especially of snow and ice at the hoof sole, which can be placed within the space enclosed by the hoof pad between the hoof pad and the hoof sole, which hoof pad lining is provided with a tube-like hump defining at least partly the enclosed space, which hump having at least partly an air-filled hollow space standing upright on the plate of plastic material and extending generally to the upper edge of the hoof pad.

Linings of this type are for instance known from the published German patent application 36 44 706. They have the purpose to avoid the adhesion of especially snow and ice between the two legs of the hoof pad and the hoof surface because those adhesions do not only have negative effects on the safety of steps of the animal provided with horse shoes, but do also increase the danger of injury.

The said disadvantages are not or not completely, respectively, overcome by the known hoof pad linings, although they already take advantage of the known idea to provide the flat lining of flexible material, for instance of plastic material with a tube-like hump, having at least partly an air filled hollow space so that the hump can be elastically deformed causing a resilient force on stepping of the hoof or the hoof pad, respectively, on a solid ground covered especially with snow and ice, which resilient force is if the pad is unloaded therefore the reason that the material included between the legs of the pad will be thrown out.

The fact that the known hoof pad linings are not successfully working on avoiding the adhesion of strange material at the pad surface between the pad legs has also the reason that

it was not known that the elastic capacity of the hump has to be adapted to the step of the hoof on the ground.

As surely known, the animal, for instance a horse, is stepping forward on the ground in a special manner according to which at first the front end of the hoof pad touches the ground. Thereafter the weight of the horse is then continuously shifted to the back so that the backward following parts of the surface of the pad touch the ground. This rolling of the pad results therein that at first the greatest part of the weight of the horse causes at the tip of the pad with respect to the ground a pressure force dependent on the weight so that the continuous hump is so strongly loaded that its useful life-time is relatively short dependent on the materials used for the pad lining. Thus, the hump will be extremely abraded and therefore its backward parts positioned at both legs of the pad opposite to one another lose their resilient throw-out function.

Therefore, the object underlying the invention is to avoid these disadvantages and especially to essentially improve the function and thus life-time of such kind of hoof pad linings.

In order to solve this object the invention proposes that the hump forms a tube-like hollow space profile provided with at least one oval hollow space and extending up to a connecting bridge connecting the two legs of the hoof pad in the range of their ends, which hump is provided at the front end of the hoof pad in the range of the connecting point of the two legs with an interruption, wherein the plastic material of the hoof pad and the hoof is free of a hump following the circumference of the hoof pad and beyond the connecting bridge in the direction of the ends of the legs.

The tube-like hollow space profile avoids because of its cross-section configuration and its extension at the inner edge of the hoof pad provided with interruptions in the front and back area of the hoof, especially the formation of clods of snow and ice on the hoof surface. The reason therefore is the elastic characteristics of the plate of plastic material as well as also the arrangement of the connecting bridge at the end of the hoof pad developing a spring tension upright to the hoof surface causing a certain amount of play if the hoof touches the ground, which play is counteracting the fixing of snow and/or ice.

Thus, the proposal according to the subject of the invention is a good combination of constructional features concerning hoof pad linings and hoof pads themselves resulting in advantageous cleaning effects and, respectively, cleanness effects.

Advantageous embodiments of the invention are characterized by the sub-claims.

The invention will be described in detail in the following related to the embodiments as shown by the drawings.

In the drawings are:

- Fig. 1        a plan view of the hoof pad comprised of plastic material provided with a connecting bridge without a pad lining;
- Fig. 2        a plan view of the plastic hoof pad in accordance with Fig. 1, provided with hoof pad lining and connecting bridge,
- Fig. 3        a plan view of an embodiment of the hoof pad lining in a scale in accordance with Figs. 1 and 2 ,
- Fig. 4        a partial cross-sectional view of the hoof pad lining along the line A1-A1 in Fig. 3, in a larger scale,
- Fig. 5        a partial cross-sectional view of another embodiment of the hoof pad lining along the line A2-A2 in Fig. 3, in a larger scale,
- Fig. 6        a partial cross-sectional view of a further embodiment of the hoof pad lining along the line A4-A4 in Fig. 3, in a larger scale,
- Fig. 7        a partial cross-sectional view of a still further embodiment of the hoof pad lining along the line A3-A3 in Fig. 3, in a larger scale.

The hoof pad 12 of plastic material as shown in Fig. 1 is provided in a manner known per se with legs 14 surrounding as an elevated body the hoof surface 3. The legs are provided

in the area of their lower ends 13 with recesses 16 for the reception of the bridge-like connecting bar 15, joining both ends 13. This connecting bar can be fixed in a manner known per se to the legs 14 for instance by means of screws 18.

The surface of the hoof pad is with the exception of the front pad end 17 provided with a profile, in order to improve the stepping safety of the hoof if the hoof is stepping forward and thus to reduce the danger of slipping.

Between the hoof pad 12 and the hoof a horseshoe-like lining 1 is positioned which is shown in Fig. 3 and which should avoid that especially snow and ice are enclosed between the two legs 14 of the hoof pad 12 on the hoof surface 3 resulting in a detrimental effect concerning the safety of step by step movement of the animal.

The hoof pad lining 1 is configured as an essential flat plate 2 comprising of flexible plastic material having an outer and an inner circumference adapted to the hoof pad 12 and comprising at its inner circumference a tube-like hump 4 defining the hoof surface 3. The hump 4 is provided with a tube-like hollow space profile 6 having different configurations as shown in Figs. 4 to 7 and extending generally up to the upper edge of the hoof pad.

This tube-like hollow space profile 6 forms at least one oval hollow space 7 as shown in Figs. 6 and 7, forming in these embodiments a lying or standing ellipse in order to improve the elasticity of the hollow space profile 6 so that the hump or bulge will be elastically deformed if the hoof steps onto a solid ground. This deformation is such that it avoids the occurrence of the accumulation of compact materials, especially solid ice and snow on the hoof surface 3.

The tube-like hump 4 extends, as shown in Fig. 2, up to the connecting bar 15, turning the two legs 14 of the hoof pad 12 in the area of their ends 13. Moreover, this hump is provided at the front end 17 of the hoof pad in the area of the joining point of the two legs with an interruption 16, as shown in Figs. 2 and 3. Beyond the connecting bar 15 and in the direction of the ends 13 of the legs, however, the plastic plate 2 of the pad lining, which is fixed together with the hoof pad 12 on the hoof in a manner known per se, is free of any hump. By this defined configuration of the hump the requested strong seat of the connect-

ing bar 15 within the recesses 16 is gained and moreover it is avoided that the ends of the hump will be too strongly deformed if the hoof steps onto the ground.

The hollow space profile 6 is continuously configured with the only exception of the interruption 16 at the front end 17 of the hoof pad 12.

Instead of a single ellipse 8, 9 as shown in Figs. 6 and 7, it is also possible to use several, especially parallel ellipses as shown in Fig. 4. On upright arrangement of the ellipses their smaller axis extends generally parallel to the hoof sole, whereas on lying arrangement as shown in Fig. 6, the large axis of the ellipse extends generally parallel to the hoof sole.

The size of the cross section of the space 7 of the hollow space profile 6 is advantageously  $\frac{1}{3}$  to  $\frac{1}{2}$  of the whole cross section of the hump and the two lower ends of the hump 4 positioned adjacent to the connecting bar 15, are, as shown in Fig. 2 cut in such a manner that the oval hollow space 7 is open.

As shown in Fig. 5, the configuration of the hollow space 7 of the hollow space profile need not be a special form of an ellipse and also need not have a special number of those hollow spaces, but is adapted to the conditions of elasticity requested for the hump 4 dependant on the material of the pad. In this connection the cross section of the hump is advantageously configured such that the inner edge 19 of the hoof pad 12 is intensively touched by the opposing wall 21 of the hump, whereas the outer wall 20 of the hump adjacent to the surface 3 of the hoof extends either as the inner wall 21 essentially vertically to the plastic material plate 2, as shown in Fig. 5, or is inclined to the latter one, as shown in Fig. 4, 6 and 7.